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AUTHOR Rutherford, Betty R.; LaVoie, Joseph C.
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ABSTRACT

The play patterns and stimulus preference of 20 preschool children were observed during low and high stress conditions. The stress manipulation was contingent upon the child's preparation for a medical appointment. Heart rate recordings were used as an index of stress. Children manifested a preference toward creative-constructive play under conditions of increased stress, with a resultant decrease in manipulative and imaginative play. Play with relevant or irrelevant toys did not change significantly during the increased stress condition. No sex differences were found for play patterns, stimulus preference, or for stress. (Author/SET)

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# THE EFFECT OF ANXIETY ON CHILDREN'S PLAY AND STIMULUS PREFERENCE

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Betty R. Rutherford and Joseph C. LaVoie

University of Nebraska at Omaha

Abstract

The play patterns and stimulus preference of 20 preschool children were observed during low and high stress conditions. The stress manipulation was contingent upon the child's preparation for a medical appointment. Heart rate recordings were used as an index of stress. Children manifested a preference toward creative-constructive play under conditions of increased stress, with a resultant decrease in manipulative and imaginative play. Play with relevant or irrelevant toys did not change significantly during the increased stress condition. No sex differences were found for play patterns, stimulus preference, or for stress.

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# THE EFFECT OF ANXIETY ON CHILDREN'S PLAY AND STIMULUS PREFERENCE

Betty R. Rutherford and Joseph C. LaVoie

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Play undoubtedly serves many functions for the developing child. Most of the research and clinical interest over the years has focused on the use of play as a cathartic mechanism or a means of coping with stress. The cathartic function has been the major impetus of psychoanalytic theory's formulations of play. Through play the exciting events, unpleasant experiences, or conflicts experienced by the child are recreated in his attempt to master the anxiety. Play also serves a cathartic function in cognitive theory, although the primary function of play is to understand the environment. According to Piaget (1962), objects once feared may provide the focus for play until the child has reduced the fear associated with a particular object. Learning theorists (e.g., Dollard & Miller, 1950) proposed that one learns to use verbal reasoning in response to cues associated with anxiety to reduce the affect. For the young child, play may function similarly to verbal reasoning in coping with the present conflicts in his life, provided that he can inhibit the internal cues associated with stress.

Gilmore (1966), in his initial research, found that young children preferred to play with toys associated with their source of stress, however subsequent studies produced equivocal results. In a more recent series of studies, Gilmore, Best, and Eakins (1971) found that IQ influenced toy choice in that high IQ children preferred simple stimuli when not stressed and more complex stimuli when stressed.

These observations suggest that play serves a problem solving function. A similar conclusion has been reached by Amen and Renison (1954) who reported that play constructiveness and high anxiety were positively correlated with IQ in preschool children. Thus the high anxiety child used creative-constructive play to cope with anxiety.

The present study investigated the child's use of play in a stressful situation. The extent to which play was used as a cathartic release or a problem solving mechanism was assessed.

## Method

### Subjects

The Ss consisted of 20 four- to five-year old children (7 girls and 13 boys) who were scheduled to visit their pediatrician for either a routine physical examination or immunizations. Children visiting a physician for the first time were excluded as were children who had experienced considerable trauma relative to medical care (e.g., an accident requiring surgery). The children were healthy with no past history of extensive medical care and had an IQ of 115 or higher.

Each S was assigned to a Home-Home (HH) or Home-Clinic (HC) play context in a within Ss design with each child serving as his own control. The HH group was interviewed twice in their homes. The HC group was interviewed first in their homes and on the second occasion at the clinic.

### Equipment

Four sets of toys (two sets at each interview) were presented in a randomly assigned order to each of the Ss. Each set contained two medically relevant toys and two nonrelevant toys of equal attractiveness.

The attractiveness of toys was determined in pilot studies with preschool children. The heart rate recordings were registered with a two channel Offner type dynography assembly which recorded on paper tape. The kinograph, introduced to the child as the "astronaut machine," and paper tape were clearly visible during the recording procedure. A stop watch was used for recording all timed responses.

Stress Manipulation

The stress manipulation was adapted from studies of play behavior in medical settings conducted by Gilmore (1965) and Gilmore and Richardson (1971). Stres was operationally defined as the children's emotional state during preparation for a medical appointment. Level of stress was based upon heart rate recordings which reflected the average variance of heart rate during the interview. The method resembles Lacey's method of tallying cardiac "bursts" (Lacey & Lacey, 1958) and the mean cyclic maxima method devised by Malstrom, Opton, and Lazarus (1965). The mean frequency of heart rate peaks was determined for the first and second interview. Subjects were assigned to the high or low stress group on the basis of a median split of differences between their heart rate recordings.

Procedure

The Ss for the study were recruited from the files of a Pediatric Clinic. Parents of the children were contacted by mail, and then by a telephone followup at which time a home visit was arranged. The acceptance rate was 80%.

The first visit for each S occurred in the home one to two weeks prior to the child's medical appointment. The Slossen Intelligence Scale was administered followed by three minutes of heart rate

recording to establish the child's general state of arousal. Six minutes of play with a randomly selected set of medically relevant and irrelevant toys followed. The E scored each S's play behavior for: play patterns—creative-constructive, manipulative, or imaginative; toy preference—medically relevant or irrelevant as defined by duration of touch; emotional behaviors during play, and diversions from play. Three additional minutes of heart rate were recorded at the end of the play period. The baseline measure of stress was determined by the child's heart rate recording over the two 3-minute periods during the first interview.

For the second visit, half of the Ss were seen in their home one hour prior to their medical appointment (HH group). The other half of the children (HC group) arrived at the clinic 30-40 minutes prior to their appointment. The child was then conducted to an examining room for the heart rate recordings and play period.

The sequence for the HH and HC groups involved three minutes of heart rate recording, six minutes of play with each of the remaining two sets of toys, followed by another three minutes of heart rate recordings. The same play behaviors scored during the first visit were again recorded.

Scoring of Play Scales

The play scales were adapted from Amen and Renison (1954). All of the scoring was done by the E, who seated herself at a reasonable distance away from the child during the play periods. Inter-rater reliabilities ranging from 89-100% were obtained between two scorers during pilot testing.

Play constructiveness was recorded at 15 second intervals. At the end of each interval, the E recorded the type of play most

representative of that period. The frequencies of creative-constructive, imaginative, and manipulative play were determined for the 48 intervals during the twelve minutes of play with two sets of toys. The play categories used were mutually exclusive.

Durations of relevant and irrelevant play were recorded as the duration of time (seconds) spent touching medically relevant or irrelevant toys. The child's toy preference for the specific interview was defined as the proportion of time spent at play with relevant toys to total time spent with all toys at each interview.

The frequency of emotional play and diversions from play were recorded at 15 second intervals. Recordings of diversions were categorized according to four types: (1) The child engages in activities with E trying to help her, play with her, or converse with her: (2) Island behaviors, play with nonsignificant additional materials, are exhibited; (3) The child spends time looking or wandering about; (4) The child's attention is continually directed toward outside noises and distractions. Two types of emotional behavior were recorded: (1) The child displays whimpering, whining, or other restless actions; (2) A strong emotional component to play behavior is noticeable.

## Results

The mean heart rate recordings for first and second interviews, the mean recordings for each three minute period, and the individual recordings for each of the twelve minutes were analyzed by separate repeated measures analyses of variance. High and low frequency of heart rate variance, based on a median split, was used as the between S's factor, and the first or second interview was used as the within S's factor.

Stress Manipulation

As expected, Ss demonstrated strong evidence of increased stress between the first and second interview. Ss' heart rate variance during the first interview ($\bar{X}$=7.57) compared to the second interview ($\bar{X}$=12.83) was statistically significant ($F$=62.51, $df$=1/16, $p < .01$). The difference between increases for the HH and HC groups was not significant ($F < 1$). Thus stress was not significantly influenced by play context.

Play Patterns

Play patterns were analyzed with an unequal N ANOVA using level of stress during the first and second interview, and play context (HH-HC) as factors. The play patterns are graphically presented in Figure 1. Creative-constructive play increased significantly ($F$=24.13, $df$=1/16, $p < .01$) for all Ss from the first to the second interview. Subjects in the high stress group engaged in a longer period of creative-constructive play during the second visit than the low stress group ($F$=6.65, $df$=1/16, $p < .01$).

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Insert Figure 1 about here

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Because the play category scoring was mutually exclusive, decreases in manipulative and imaginative play had to follow increases in creative-constructive play. Imaginative play decreased significantly ($F$=18.78, $df$=1/16, $p < .01$) with the high stress group demonstrating a greater decrease than the low stress group ($F$=3.67, $df$=1/16, $p < .10$). Manipulative play decreased significantly for all Ss ($F$=5.70, $df$=1/16, $p < .05$).

Play context (HH or HC) was significant only for imaginative play. The HC group displayed less fantasy play ($F$=9.98, $df$=1/16, $p < .01$).

Sex was not a significant factor for play patterns. Few Ss demonstrated emotional behavior and divergencies in play behavior did not increase significantly during the second visit.

Toy Preference

Contrary to predictions, the Ss played less with the relevant toys, although the difference was not significant ($F=1.91$, $df=1/16$, $p > .05$). The effect of play context (HH or HC) was also nonsignificant ($F < 1$). Reduction in stress as a result of play with the medically relevant toys was not significantly greater on the second visit than the first visit ($p > .05$).

## Discussion

Contrary to psychoanalytic theory, children in the present study did not use fantasy play to reduce stress, rather they chose creative-constructive play. Children under high stress apparently prefer to build objects in play or to work with materials conducive to creative applications, suggestive of problem solving. This finding supports the observation of Gilmore et al. (1971) that subjects under stress prefer more complex stimuli. However, the children's choice of creative-constructive play may have resulted from a desire to control their feelings of stress by engaging in an interesting and demanding activity rather than a preference for complexity as suggested by Gilmore et al. (1971).

Stimulus preference, in the form of play with the medically relevant toys, was not related to stress. Sixty-five per cent of the children preferred medically relevant toys during the low stress condition compared to 35% for the high stress condition. This result also supports

the research of Gilmore (1966, 1971) and clearly suggests that stimulus preference is not a factor in stress reduction as assumed by catharsis.

The finding that stressed children respond well to creative-constructive play has many applications for applied settings. For example, substituting an expected examination with new learning materials may result in enthusiasm toward learning.

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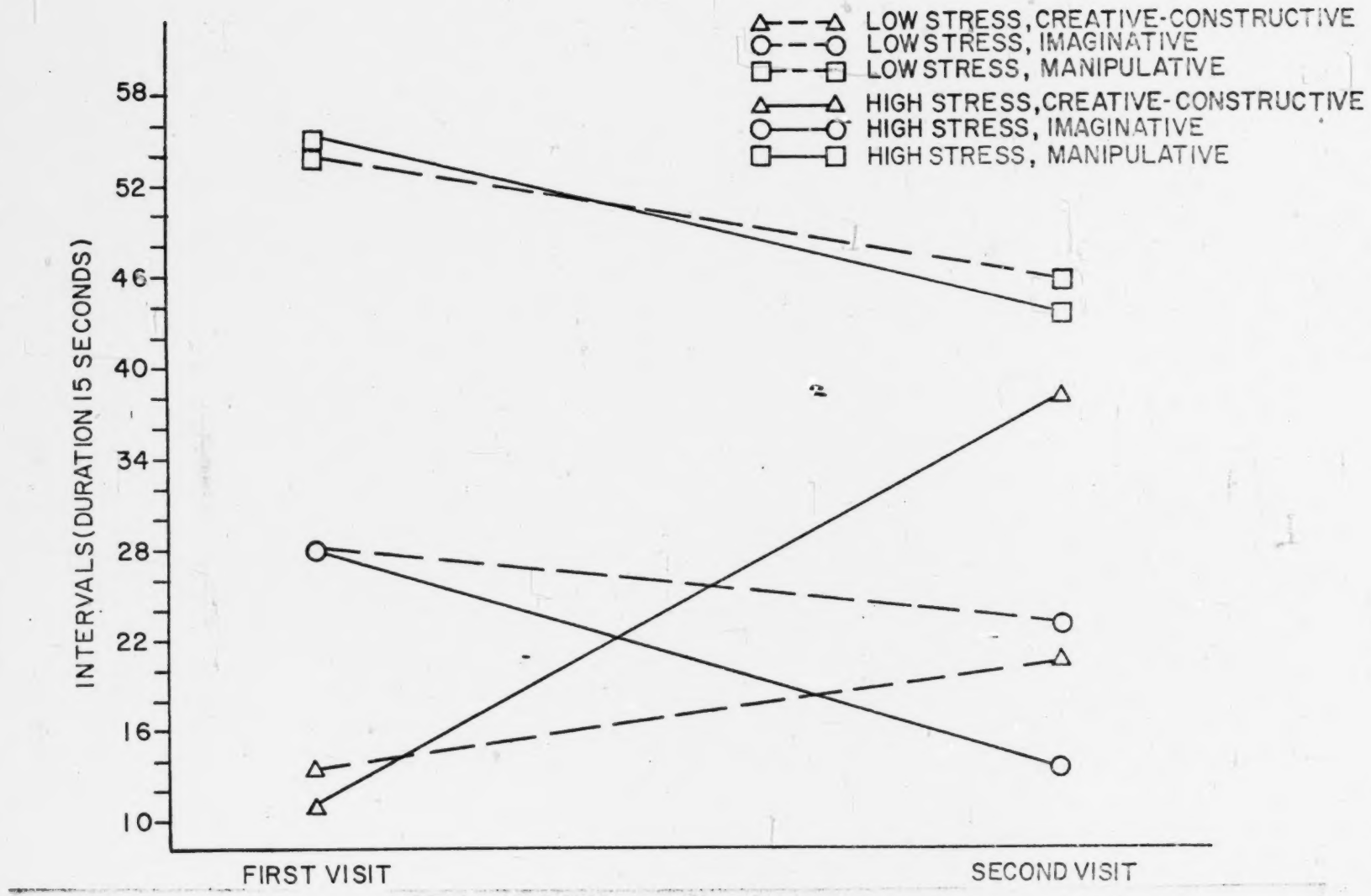
"Figure Captions"

Fig. 1. Interaction of play patterns with high and low stress for first and second visit


LOW STRESS, CREATIVE-CONSTRUCTIVE
LOW STRESS, IMAGINATIVE
LOW STRESS, MANIPULATIVE
HIGH STRESS, CREATIVE-CONSTRUCTIVE
HIGH STRESS, IMAGINATIVE
HIGH STRESS, MANIPULATIVE
INTERVALS (DURATION 15 SECONDS)
58
52
46
40
34
28
22
16
10
FIRST VISIT
SECOND VISIT